



DIVISION OF
CORPORATION FINANCE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

June 7, 2012

Via E-Mail

Ivan Bergstein, M.D.
Chairman, President and Chief Executive Officer
Stemline Therapeutics, Inc.
750 Lexington Avenue, Sixth Floor
New York, New York 10022

Re: Stemline Therapeutics, Inc.
Registration Statement on Form S-1/A#1
Filed May 21, 2012
File No. 333-180515

Dear Dr. Bergstein:

We have reviewed your amended registration statement and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter by amending your registration statement and providing the requested information. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your registration statement and the information you provide in response to these comments, we may have additional comments.

General

1. We note your response to our prior comment 8. However, it does not appear that you have provided further definition or explanation of the term "high throughput screening." Please provide a definition or explanation of this term wherever it is first used in your prospectus.

Overview, page 1

2. Please expand your disclosure here to clarify who filed and holds the INDs for each of SL-401 and SL-701, and when each IND application was filed.

Risk Factors

Third parties have conducted all clinical trials of SL-401 and SL-701 so far, and our ability to influence the design and conduct of such trials has been limited...., page 28

3. Please expand this risk factor to explain how you expect the intended transfer of the INDs for each of SL-401 and SL-701 to your company can and will take place. Please also provide a time context for the intended transfers.

Dilution, page 48

4. Please provide us your calculation of your historical net tangible book value at March 31, 2012. Based on the information in your financial statements, we calculated a net tangible book value of \$111,984 and a book value per share of \$0.06.

License and Research Agreements, page 94

5. We note your responses to our prior comments 33 and 34. For each of these four agreements - with Scott and White Memorial Hospital dated June 2006, with University of Pittsburgh dated September 2009, and the two agreements with University of Pittsburgh both dated March 2012 – please provide the following information individually on an agreement-by-agreement basis:
 - The aggregate amount of all fees paid to date under the agreement including initial, annual, maintenance and milestone fees;
 - The aggregate of all additional milestones fees that may be paid in the future under the agreement.

Please note that we consider these aggregate amounts to be material to an investor's understanding of your company's financial position, as opposed to the discreet amounts for which you have requested confidential treatment.

6. Please confirm your understanding that if, in the future, it becomes probable that your company will fail to complete any single regulatory milestone within the time periods specified in your license and research agreements, that such information would be material and would require prompt disclosure.

Financial Statements

Statements of Operations, page F-4

7. Please revise your presentation to include your pro forma earnings per share information for the latest period presented, not your inception-to-date period. This comment also applies to your interim statements of operations on page F-28.

Notes to Financial Statements

Note 2. Summary of Significant Accounting Policies

Other Income and Expenses, page F-12

8. Please revise your policy disclosure added in response to comment 23 to clarify why your grant program revenue is recognized as earned when received consistent with your response. In this regard, please link your disclosure regarding the reimbursement of expenses to expenses already incurred and that you have no future performance or refund obligations.

Note 7. Capital Structure

Redemption of Series A Preferred Stock, page F-17

9. We acknowledge your response to prior comment 41. Please address the following additional comments:
 - Please revise your disclosure, consistent with your response, to indicate how you determined the fair value of the common stock and also to disclose how the redemption of preferred shares resulted in such a large gain, i.e. the liquidation of Pequot Funds and the restricted nature of the preferred and common stock.
 - Please tell us whether any of the shares in the contemporaneous common stock sale in April 2010 used to value the common stock issued in the Pequot transaction were sold to related parties. If so, please explain to us how you can conclude that the \$5.27 per share sale price is indicative of a market participant determined fair value.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Act of 1933 and all applicable Securities Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

Notwithstanding our comments, in the event you request acceleration of the effective date of the pending registration statement please provide a written statement from the company acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and

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- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Please refer to Rules 460 and 461 regarding requests for acceleration. We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

You may contact Dana Hartz at 202-551-3648 or Mark Brunhofer at 202-551-3638 if you have questions regarding comments on the financial statements and related matters. Please contact Michael Rosenthal at 202-551-3674 or me at 202-551-3715 with any other questions.

Sincerely,

/s/ Jeffrey Riedler

Jeffrey Riedler
Assistant Director

cc: James Barrett
Edwards Wildman Palmer LLP